# THE DER UPDATE

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*Distributed Energy Resources...the Power of Choice*

## Industry News

### A Model For Future DG Plants

CILCO, an AES company, and Caterpillar reached a service agreement for CILCO to provide all the electric and thermal energy for Caterpillar's manufacturing and research facilities southwest of Peoria, Ill. The result was the construction by AES of a $51 million Medina Valley cogeneration plant in Mossville, Ill. The Medina Valley cogeneration plant consists of three 12.2 MW Titan 130 combustion engines, two 8.9 MW steam turbines, a natural gas engine driven chiller, two electric chillers, three absorption steam chillers and three heat recovery steam generators (HRSGs). The HRSGs and the combustion turbines were supplied by Solar Turbines as a package. A stand-alone gas-fired auxiliary boiler has been installed as a backup to supply thermal energy to Caterpillar when the cogeneration is down for service. Caterpillar's Mossville manufacturing and research campus will receive electricity, process steam, heat and chilled water from the cogeneration plant. It will produce electricity for the company's 882,000 square foot Mapleton foundry. According to Tom Thomas, president of AES Medina Valley Cogen, LLC, the Medina Valley plant's design is a model for future AES distributed generation plants.
*Power Engineering, June 14*

### Get Paid To Use Less Power

California businesses can receive funds from the state if they participate in a new five-year energy-conservation program from the California Power Authority. The Demand Reserves Partnership Program will pay monthly fees to businesses that sign a contract with the state and agree to reduce power usage when the state asks. The amount is based on the reduction a business provides. The Power Authority estimates the program will cost $7 million this year and will be able to call on up to 250 MW of energy. Information about the program is available on the Power Authority's Web site, www.capowerauthority.ca.gov. Power usage of all businesses involved can be monitored in real time in the program's internet-based clearinghouse of information. If the Department of Water Resources sees that power is needed in a certain part of the state, it will notify its energy-scheduling coordinator, a company called APX, which will then notify other companies called aggregators. The aggregators will make a separate agreement with each business that chooses to participate in the demand-reduction program. The aggregator will notify the business when it must shave power usage, and the unused power will be available for channeling to the state's reserve capacity.
*The Orange County Register, CA, June 19*

### Introducing WADE

The World Alliance for Decentralized Energy (WADE) has been formed by a group of major companies and national industry associations. WADE was convened to bring about change in the way the world makes electricity. The five main objectives for a more cost-efficient and less polluting global electricity system include grid access on fair and transparent terms for all DE systems; innovative market based rules that encourage greater efficiency of electricity and heat generation; full price recognition for both the locational value and environmental benefits of DE; New incentives for incumbent monopoly electricity companies to reduce fuel use and improve efficiency; and the establishment of a well-resourced DE promotion and outreach in every country. The founding WADE members include national cogeneration and DE organizations in Europe, the USA, China, India, and Brazil. Industry founders include Solar Turbines, Wartsila, and FuelCell Energy.

### ARICE Solicitation

The California Energy Commission (CEC) under its Public Interest Energy Research (PIER) Program issued a notice of proposed awards for Advanced Reciprocating Internal Combustion Engine (ARICE) Systems research, development, and demonstration projects for distributed generation applications in California. Waukesha Engine, Dresser Inc., Lawrence Livermore National Laboratory (LLNL) and Argonne National Laboratory (ANL) submitted proposals that won approval. Waukesha requested almost $3M with approximately $1.5M in matching funds submitted a proposal for an ultra low emissions system development project. LLNL's $2M project with $600,000 in matching funds is for a low-cost, high efficiency, Ultra-low NOx ARICE solution using HCCI combustion. ANL requested $1.6M with $150,000 in matching funds for a laser based ignition system for reciprocating natural gas engines.

*(Continued on page 3)*

*57% of fossil fuel generating plants were online before 1972.**

## DER/ZEB Showcase

A Distributed Energy Resource and Zero-Energy Building (DER/ZEB) Showcase was held at Oak Ridge National Laboratory (ORNL) and Electric Power Research Institute (EPRI) on June 17, 2002. The showcase featured the dedication of ORNL's Cooling, Heating and Power Integration User Center as a national user facility; the dedication of a photovoltaic facility, also at ORNL, which is part of TVA's Green Power Switch Program; the dedication of a Habitat for Humanity subdivision near Knoxville that features ZEB technologies; and the dedication by EPRI of a DER Center at the EPRI-PEAC facility.

### Cooling, Heating and Power Integration Laboratory

ORNL's Cooling, Heating and Power Integration Laboratory will enable researchers from industries, universities and other institutions to conduct tests on distributed energy products and systems. User facilities allow researchers to conduct proprietary and nonproprietary work. They also encourage collaborative efforts among ORNL, private industry, and other institutions. ORNL's Office of Technology Transfer and Economic Development coordinates these efforts. "This user facility is a key asset to DOE's efforts to develop advanced and cost effective distributed generation technologies," said Marilyn Brown, Director of ORNL's Energy Efficiency and Renewable Energy Program.

Distributed energy resources make use of energy normally wasted in the power generation by combining electricity generation with heating and cooling systems. Integrating building, cooling, heating and electricity systems with on-site or near-site electricity generation could increase energy efficiency by as much as 30 percent, reduce carbon emissions by 45 percent or more, and improve indoor air quality through humidity control. The laboratory contains a 30 kW microturbine, heat recovery units, and dehumidifiers to test distributed energy sources and projects. The new user facility will enable developers of these projects to do performance and reliability testing.

Seven companies have been selected as industry partners to develop package systems; and some will be the first customers of the Cooling, Heating and Power Integration User Center. They are Burns and McDonnell, the Gas Technology Institute, NiSource Energy Technologies, Capstone Turbine Corp., Honeywell Laboratories, United Technologies Research Center, and Ingersol Rand. ORNL has led an R&D program on heating, cooling and ventilating equipment since the early 1970s. This expertise is now being focused on technologies essential to successful CHP, including turning waste heat generated by power-producing equipment, such as microturbines or fuel cells, into useful heat for thermally activated cooling and desiccant generation. The facility designation was announced during a daylong distributed energy resources showcase held at ORNL. ORNL is a multiprogram science and technology laboratory managed by UT-Battelle for the Department of Energy.

### EPRI DER Center

Hank Courtright, Vice President of EPRI-PEAC's parent company, the EPRI, was on hand for the ceremony to dedicate a unique facility for testing and evaluating newly developed energy technologies. Located in Knoxville, Tennessee, EPRI-PEAC's Power Quality and Distributed Resources Test Center (PQ and DR Center) was designed to provide a controlled environment for unbiased assessments of promising technologies. "The evolution of a deregulated energy market has brought a surge of interest in distributed resources for use in power generation, energy storage, and power quality applications," Courtright said. "Before these technologies enter into service, they must be evaluated for the utility industry and for the electricity consumers who will be using this equipment in their homes and businesses."

The electrical design of the PQ and DR Center facilitates testing of complete distributed generation, energy storage, and end-use systems. "We look at how the new technologies interact with similar technologies, with end-use equipment, and with the power grid", says Tom Key, EPRI-PEAC's V.P. for technology. "Our distributed generation center features a variety of innovative technologies for generating electricity, on or off the grid, with a wide array of residential, commercial, and industrial loads."

"The ability to operate these interconnected elements in various combinations creates a unique platform for exploring distributed generation and power quality issues critical for a society that increasingly depends on digital-quality power," EPRI's Courtright concluded.

*They account for 59% of SOx emissions, 47% of NOx, and 42% of C02 in 2001, while producing 42% of all electricity produced by fossil fuel plants.**

## DOE NEWS

### New Ballot Action Planned for IEEE P1547

The IEEE P1547 Working Group met in Vail, CO, on June 4-7,2002 to review draft 9 of the proposed technical standard for interconnecting distributed resources with electric power systems. The new draft differs significantly from the earlier draft. It addresses concerns about the scope and limitations of the standard, technical requirements related to spot and secondary grid networks, and other issues raised in the unsuccessful vote on draft 8 in October 2001. After discussion by the full working group, the writing committee made additional changes to the new draft to reconcile a few remaining issues. A new ballot on the draft standard is expected in August. Members of the working group expressed general satisfaction with the new draft and it will probably achieve the required 75% affirmative vote in the upcoming ballot action. The proposed standard received a 66% affirmative vote in both the original March 2001 ballot and the recirculation vote in October 2001. If the ballot is successful, the P1547 interconnection standard could be approved by the IEEE Standards Board as early as December 2002.

### CHP Team Meetings Start-up Again

A CHP Team meeting was held in Washington, D.C., on Tuesday, June 11, 2002, from 1:30 PM-3:00 PM at the office of Energetics, Incorporated. Approximately thirty people attended the meeting either in-person or via teleconference, including representatives from the Office of Distributed Energy Resources (ODER), the Federal Energy Management Program (FEMP), several DOE regional offices, the U.S. Environmental Protection Agency (EPA), the private sector, and non-governmental organizations. Topics covered included updates on DOE's CHP activities—including reports from ODER, FEMP, and the regional offices—and updates on EPA's efforts, particularly the EPA CHP Partnership. The Midwest is reporting great success with its Midwest CHP Initiative and Regional Applications Center. The Northeast, Southeast, Southwest, and Mid-Atlantic regions have recently been discussing the formation of initiatives and applications centers modeled after the Midwest. The Team meeting was followed by a planning meeting for the 3rd Annual CHP Roadmap Workshop, which will be held in Boston on October 23-25, 2002. The Roadmap meeting will be held in conjunction with the Boston FEMP-DER Distributed Energy Resources for Federal Facilities Workshop.

## Regional Office News

### ARO hosts CHP Initiative Meeting

On May 22, the Atlanta Regional Office, with the assistance of Ted Bronson, of the Gas Technology Institute, and Suzanne Watson, of the Northeast-Midwest Institute, convened a group of individuals with an interest in CHP in the southeastern states to discuss the potential of establishing a CHP working group. At the meeting an overview was given on the National CHP roadmap and the related regional CHP activities. The types of constituents of these regional groups and what has been learned from existing partnerships was discussed. With this knowledge, the group discussed particular considerations for the southeast. All of these thoughts were able to fit into five specific focus areas: market development, permitting, education and outreach, policy and interconnection. The next steps, such as larger constituency identification, were identified, and will be completed before the next meeting, tentatively scheduled mid-August. Nearly all invited were present attended and were more than willing to volunteer for focus groups.

## Materials Tech Briefs

Advanced materials and coatings are currently being developed for industrial turbines to make the turbines more efficient with less harmful emissions. The High-Velocity Burner Rig, which simulates the combustion conditions inside typical industrial gas turbines, evaluates the long-term durability of these advanced materials and coatings. This rig consists of a sophisticated combustion system analogous to a conventional natural gas burner on a stove except that the combustion gases generated are at much higher temperatures, pressures, and velocities. These gases pass over special test coupons of the material of interest. After exposure, the coupons are examined to determine their durability. A High Velocity Burner Rig is being designed and built at Honeywell Engines in Phoenix that will simulate the environmental conditions typical of turbine nozzles and blades. Structural ceramics and environmental barrier coatings that have adequately survived Keiser Rig testing at Oak Ridge National Laboratory will be evaluated in the new facility. All facility resources (dedicated air compressor, steam boiler, super heater, gas compressor, etc.) were sized to match the operating envelope of the High Speed Burner Rig have been received. Building permits for the new facility were granted by the City of Phoenix and building modifications have been initiated. A combined conceptual and preliminary design review was held this quarter at Honeywell Engines in Phoenix with representatives of DOE in Chicago and Oak Ridge National Laboratory.

***For next week:*** the DER Update will feature the release of the Distributed Generation Strategic Plan from the California Energy Commission. The document can be downloaded from www.energy.ca.gov/distgen.

*Older plants, built before 1972, release twice as much S02 and almost 25% more NOx. C02 emissions are similar between older and new plants.**

# Calendar of Events

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| **JUNE 2002** | | | |
| 23-25 | IDEA 93rd Annual Conference & Expo | Baltimore, MD | www.districtenergy.org |
| 25-26 | DER Federal Energy Management Program Workshop | Chicago, IL | www.eren.doe.gov/femp/techassist/der_resources.html |
| 26-29 | Building Energy 2002 and the Mid-Atlantic Sustainability Conference | East Brunswick, NJ | www.nesea.org |
| 27-28 | The Business Case for Cogeneration Regulatory Initiatives | Chicago, IL | www.cbinet.com |
| **JULY 2002** | | | |
| 11-12 | Powering E-Business Part 3: Exploring Energy, Deregulation, and the Digital Society | San Francisco, CA | www.epri-peac.com/ebusiness3/index.html |
| 21-25 | IEEE Power Engineering Society Summer Meeting 2002 | Chicago, IL | www.ieee-spm2002.org |
| **AUGUST 2002** | | | |
| 18-23 | Summer Study on Energy Efficiency in Buildings | Pacific Grove, CA | www.aceee.org |
| **SEPTEMBER 2002** | | | |
| 19-20 | Energizing America's Cities | Chicago, IL | www.gastechnology.org/pub/aboutgri/2000ar/eac/eacindx7.htm |
| 30-Oct. 2 | 7th National Green Power Marketing Conference | Washington, DC | www.eren.doe.gov/greenpower/conference |
| **OCTOBER 2002** | | | |
| 9-11 | Combined Heat and Power Expo | Atlanta, GA | Ted Kurklis; 770-449-1595 |
| 24-25 | DER GridWise Meeting (Communication and Control Systems) | Skamania, WA | Brian Marchionini, 202-479-2748 |
| 23-25 | DER Federal Energy Management Program Workshop Held in Conjunction with the #rd Annual CHP Roadmap Workshop | Boston, MA | www.eren.doe.gov/femp/techassist/der_resources.html |
| 29-30 | 15th NREL Industry Growth Forum | Albany, NY | www.cleanenergyforum.com |
| **NOVEMBER 2002** | | | |
| 6-8 | AGA/EEI Energy Information Technology Conference and Expo | Las Vegas, NV | 720-548-5442 |

**According to a General Accounting Office Study recently released. www.gao.gov/new.items/d02709.pdf*